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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/689,366

10/20/2003

Mark Beaumont

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11/15/2007

JONES DAY

500 GRANT STREET

SUITE 3100

PITTSBURGH, PA 15219-2502

EXAMINER

JOHNSON, BRIAN P

ART UNIT

PAPER NUMBER

2183

MAIL DATE

DELIVERY MODE

11/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/689,366

Applicant(s)

BEAUMONT, MARK

Examiner

Brian P. Johnson

Art Unit

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-27 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 16-22 and 28 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. Claims 1-28 are pending.

Papers Filed

2. Examiner acknowledges receipt of claims amendments, remarks and replacement drawings submitted on 03 July 2006 and 31 July 2006.

Title

3. The title is accepted.

Drawings

4. The drawings are accepted.

Specification

1. Objections are withdrawn in view of Applicant's amendments.

Claim Objections

2. Objections are withdrawn in view of Applicant's amendments and arguments.

Claim Rejections - 35 USC § 112

5. Rejection is withdrawn in light of Applicant's amendments.

Claim Rejections - 35 USC § 101

6. Rejection is withdrawn in light of Applicant's amendments.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 5, 10-13, 16, 21, 22 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor (U.S. Patent No. 4,992,933).

9. As per claim 1, Taylor teaches a method for generating [a] reflection of data in a plurality of processing elements, comprising:

shifting the data along either the rows or columns of the plurality of processing elements (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) until the processing elements in the rows or columns have received the data held by every other processing element in that row or column, respectively; *The examiner asserts that every processing element in the matrix receives data as it is being shifted from a different processing element. Collectively, every element receives data held by every element.*

selecting from said received data a final output based on a processing element's position. The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.

10. As per claim 12, Taylor teaches a method for generating [a] reflection of data in an array of processing elements, comprising:

shifting the data along either the rows or columns in the array (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) a number of times equal to $N-1$ where N equals the number of processing elements in the rows and columns, respectively; *The examiner asserts that for the case where $N=4$, Taylor's invention performs a total of $N-1$ shifts.*

For $n=4$, $1+n/2 = n-1$.

outputting data from each processing element as a function of that element's position in one of the row and column. *The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.*

11. As per claims 2 and 13, Taylor teaches the method of claims 1 and 12 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location, said selecting being responsive to said initial count. *The examiner asserts that the NEWS setting for each processing element sets the shift count to $1+(n/2)$ (Col. 10 line 18).*

Further, data is made final (output) after the final shift has occurred, which is resultant on the initial count value.

12. As per claims 5 and 16, Taylor teaches the method of claims 2 and 13 additionally comprising maintaining a current count in each processing element, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that Taylor's processor inherently keeps track of the shift count as a current count. If no current count was maintained, the processor may never stop shifting data between processing elements.*

13. As per claims 10 and 21, Taylor teaches the method of claims 1 and 12 wherein said shifting includes a wrap shift. *Fig. 7a and 7b disclose shifting occurring where values wrap from one row/column to the row/column on the other side of the array.*

14. As per claims 11 and 22, Taylor teaches the method of claims 10 and 21 wherein said wrap shift includes shifting data west to east and east to west along rows, [or] includes shifting data north to south and south to north along columns. *Fig. 7b discloses data moving east to west along the row and from west to east as it wraps from the far left column to the far right column.*

15. As per claim 28, Taylor teaches a memory device carrying a set of instructions which, when executed, perform a method comprising: shifting the data along either the rows or columns of the plurality of processing elements (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) until the processing elements in the rows or columns have received all the data held by every other processing element in that row or column, respectively; selecting data as a final output based on a processing element's position. *The examiner asserts that every processing element in the matrix receives data as it is being shifted from a different processing element. Collectively, every element receives data held by every element. The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.*

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 6-9 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor.

18. As per claims 6 and 17, Taylor teaches the method of claims 5 and 16 but fails to disclose wherein said maintaining a current count includes altering said initial count at programmable intervals by a programmable amount.

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19. Official Notice is taken that decrementing a counter from an initial value for every iteration of a function is well known in the art.

20. Decrementing an initial value provides the benefit of allowing a comparison to a single known value (ie, zero) in lieu of comparing to a second value stored in a register. By comparing to a known value like zero, no additional storage is required to maintain the comparison value.

21. It would have been obvious to one of ordinary skill in the art at the time of invention to have decremented the initial count value upon each iteration of the shift until the value reached zero.

22. As per claims 7 and 18, Taylor teaches the method of claims 5 and 16 but fails to disclose wherein said initial count is decremented in response to said shifting of data to produce said current count.

23. Official Notice is taken that decrementing a counter from an initial value for every iteration of a function is well known in the art.

24. Decrementing an initial value provides the benefit of allowing a comparison to a single known value (ie, zero) in lieu of comparing to a second value stored in a register. By comparing to a known value like zero, no additional storage is required to maintain the comparison value.

25. It would have been obvious to one of ordinary skill in the art at the time of invention to have decremented the initial count value upon each iteration of the shift until the value reached zero.

26. As per claims 8 and 19, Taylor teaches the method of claims 6 and 18 wherein said selecting occurs when said current count is non-positive. *The examiner asserts that zero is a non-positive value.*

27. As per claims 9 and 20, Taylor teaches the method of claims 1 and 12 additionally comprising maintaining a local count including setting a counter to a first known value. *The examiner asserts that Taylor's processor inherently keeps a shift count for moving data from processing element to processing element. If the count was not maintained, the processor would not know when to stop shifting data.*

28. Taylor fails to disclose counting up from said first known value based on the number of shifts that have been performed, said selecting occurring when a current count equals a target count.

29. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

30. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

31. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored value required by the NEWS setting to ensure the proper number of shifts was performed.

Allowable Subject Matter

32. Claims 3-4 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

33. Claims 23-27 contain allowable subject matter over prior art of record.

34. The following is a statement of reasons for the indication of allowable subject matter: Taylor's processor inherently contains a count value which dictates how data values are shifted from one element to another. Applicant's processor sets count values for each row or column based on the equations given in claims 3-4, 14-15 and

23. No teaching in the prior art of record discloses using such count values to achieve a matrix reflection.

Response to Arguments

1. Applicant's arguments filed 03 July 2006 have been fully considered but they are not persuasive.

2. Applicant states:

"A second algorithm disclosed in Taylor begins at the bottom of column 9 and continues on column 10. The algorithm is comprised of various global shift instructions which may or may not need to be locally modified. At the end of all of the instructions, the data arrives at the appropriate processing element such that the processing element need output only the last piece of data received. It is thus seen that Taylor discloses a method in which the data is moved a number of steps, with each piece of data arriving at the appropriate processing element at the end of the loop. A processing element need only output the last piece of data it receives. In contrast, and as set forth in amended claim 1, each of the processing elements receives data from all of the other processing elements from either the row or column in which that particular processing element is located. Thereafter, the processing element must select from amongst all of the received data based on that processing element's position in the array to select an appropriate final output. It is applicant's position that the examiner has not demonstrated that Taylor anticipates independent claim 1. Accordingly, it is respectfully submitted that the rejection of independent claim 1 under 35 U.S.C. § 102(b) on the basis of Taylor be withdrawn."

Examiner disagrees. The claim language, as amended, is still subject to various interpretations, each reasonably disclosed by Taylor. The particular verbiage contested is "selecting from said received data a final output based on a processing element's position." It appears from Applicant's remark that this language is intended to convey that many inputs are accepted by the processing element and each of those inputs are simultaneously evaluated, resulting in a single final output chosen.

Alternatively, the reference could be interpreted to suggest that a particular processing element receives multiple inputs over several clock cycles. During each

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clock cycle an evaluation is made based on the data received and "on [the] processing element's position" to determine whether the received data should be the "final output" of the processing element, or whether a subsequently received data will be the final output before ultimately retaining the received information.

This interpretation, for example, appears to be an appropriate representation of the claim language and contains limitations disclosed, in their entirety, by Taylor. As Applicant recognized, the processing elements of Taylor are only required to output the last data received; however, this is not always the case. Eventually, the data will be retained by the processing element. It follows that the data received just prior to this retained data was the "final output" of that processing element. Accordingly, this "final output" is based on the "processing element's position."

Conclusion

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bratt et al. (U.S. Patent No. 6,877,020) disclose performing a matrix transpose by shifting rows and columns a number of times based on the row or column index.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

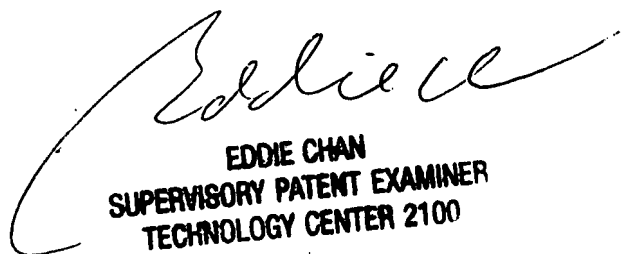
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Johnson whose telephone number is (571) 272-2678. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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